

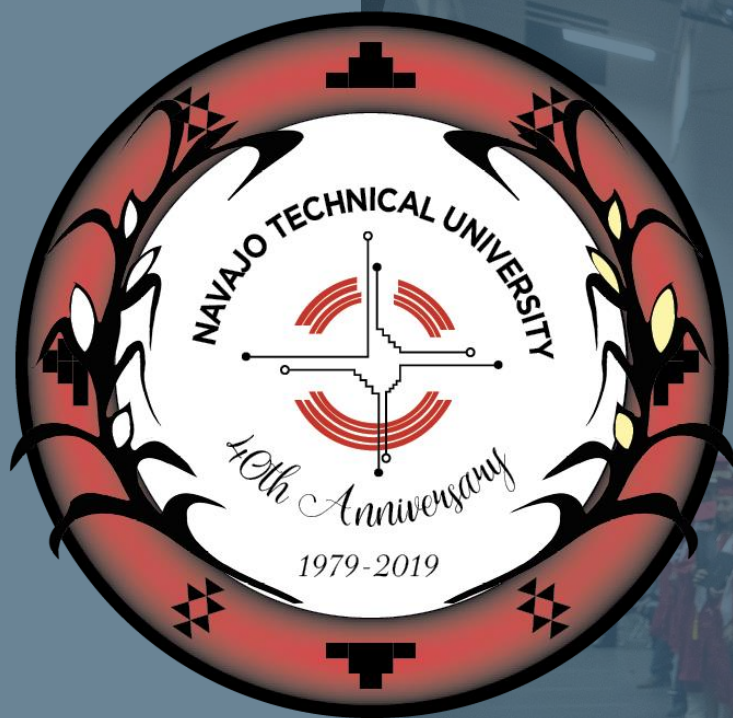
Advanced Manufacturing Capabilities

Peter Romine

Professor & Head Electrical Engineering

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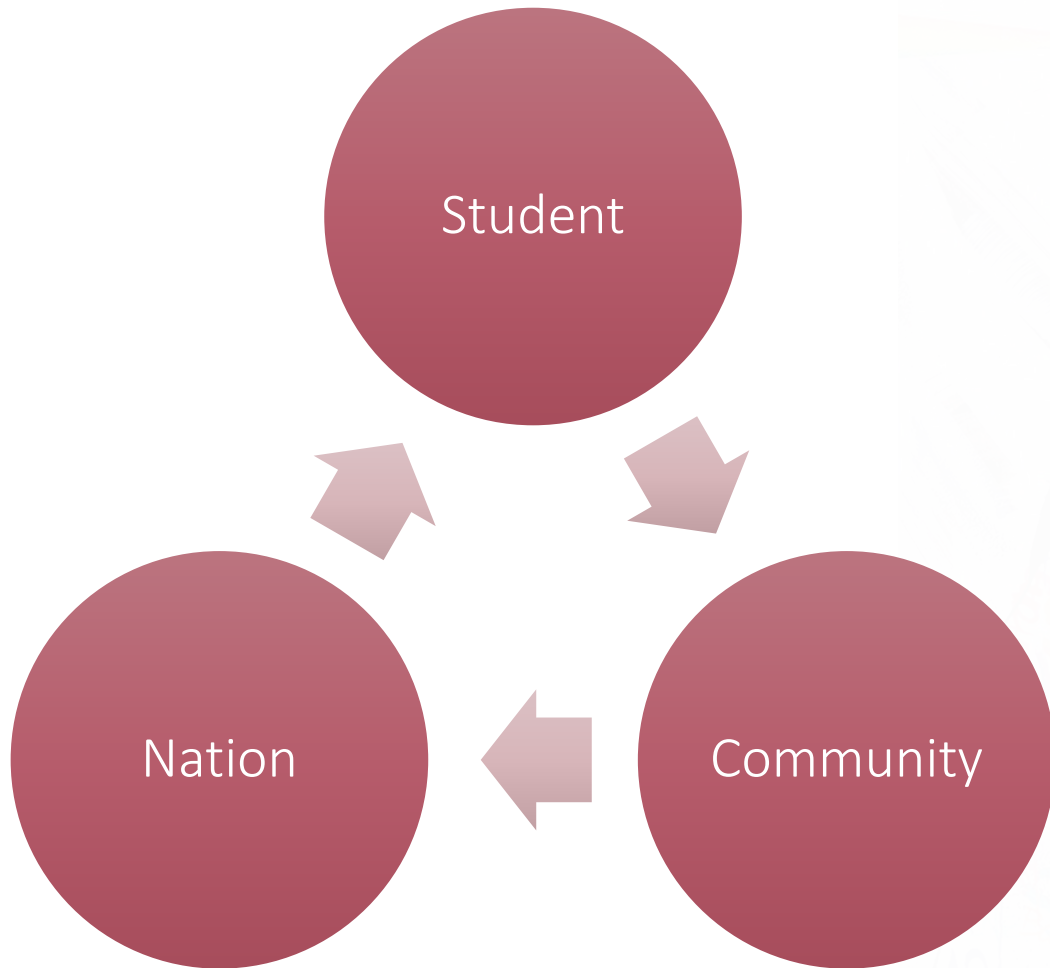
NTU Center for Advanced Manufacturing Director



“Endless Possibility”



PAVING A PATH TOWARD SELF-EMPOWERMENT



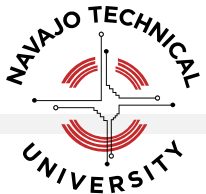
BECOMING THE NAVAJO NATION'S FIRST UNIVERSITY

- NTU became a university in 2013, specializing in Science, Technology, Engineering, and Math, as well as vocational/technical programs.
- NTU offers a M.A. degree in Diné Culture, Language & Leadership and will be soon applying for accreditation with the Higher Learning Commission for a Ph.D. program.
- Will also apply for a MS in Management Information Systems with the HLC.
 - NC-SARA member
 - Only institution to currently meet new federal regulations



FOCUSING EFFORTS ON ACADEMIC EXCELLENCE

- NTU currently offers 23 certificate programs, 20 associate degrees, 11 baccalaureate degrees, and 1 graduate degree.
- It's NTU's responsibility to provide value to the communities we serve through:
 - Research ←
 - Community engagement
 - Service learning
 - Activities designed to foster cultural preservation
- NTU's recent focus has been on high quality STEM programs, and curriculum with two foci:
 - Economic development ←
 - Meeting the specific needs of the Diné people.



OBTAINING NATIONAL ACCREDITATIONS

- The **National Center for Construction Education Research** accredits NTU's Construction Technology and Electrical Trades programs, whereas Welding students are able to earn certification through the American Welding Society.
- NTU's Culinary Arts and Commercial Baking programs are accredited by the world's largest chef's association, the **American Culinary Federation**.
- The **American Veterinary Medical Association** recently accredited NTU's Veterinary Technician program, expanding career opportunities for graduates.
- NTU's Electrical Engineering and Industrial Engineering programs received **ABET** accreditation in 2018, becoming the first TCU to hold such accreditation in the nation.



WET LABS AND CLASSROOM SPACE

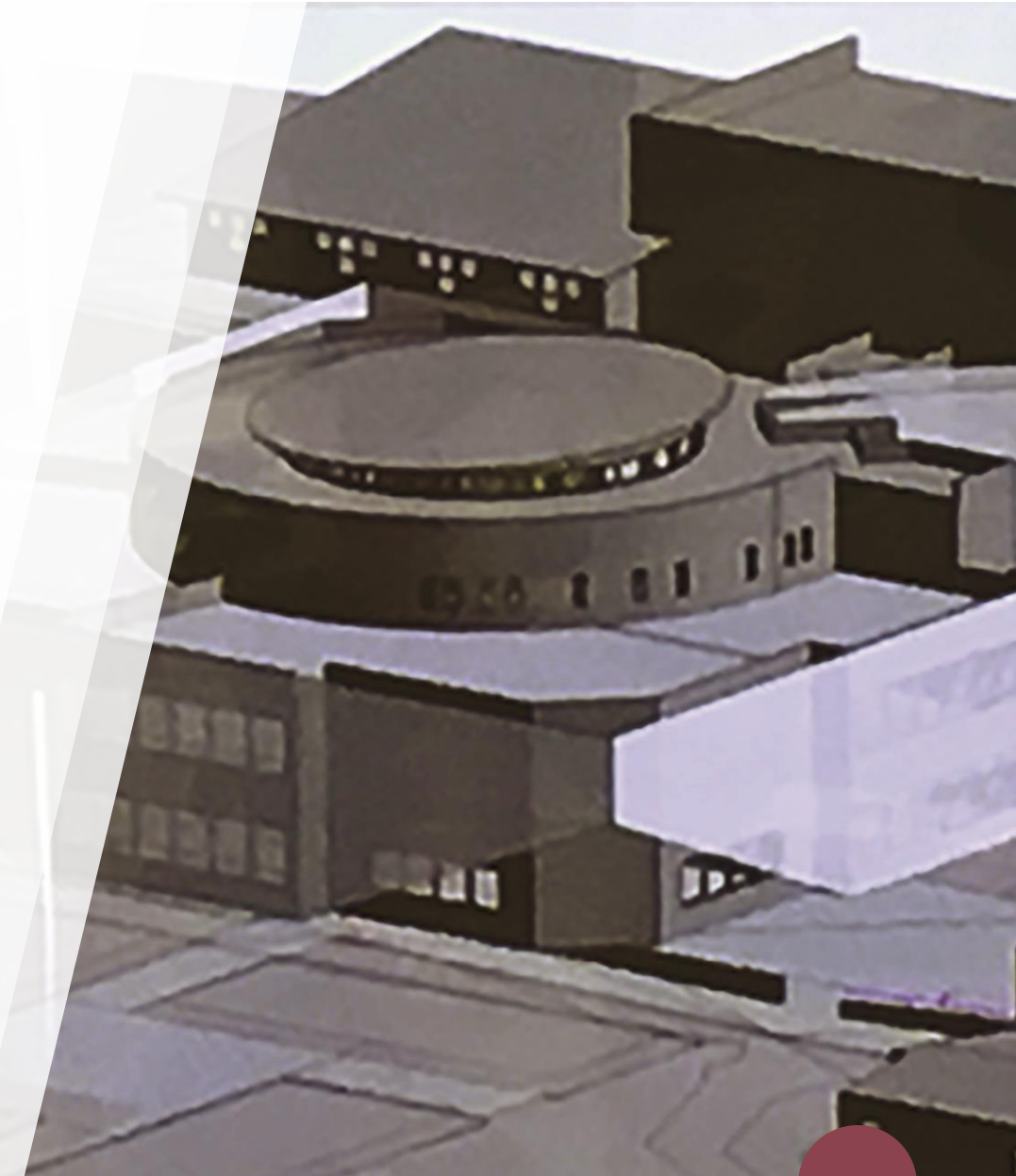
- State-of-the-art chemistry and biology labs in Crownpoint that are designed for education and research purposes.
- This is an economic development effort since the lab will be selling a variety of advanced EPA certified services.



ACADEMIC BUILDING

(30,000 sq. ft.)

- Architectural design and engineering work has been completed for a new academic building to be located where modular classrooms are located.
- Anticipated completion date: 5/31/20



METROLOGY & MATERIALS TESTING BUILDING

- Metrology building is designed to be a lab for metrology research and education. Total cost is \$2.5 million.
- The building will supplement the work of NTU's Center for Digital Technologies by providing technologies and equipment that are essential to contemporary quality assurance and control in a wide range of manufacturing, structural and materials analysis, and measurements.
- The Navajo Nation has provided \$1.5 million from Navajo Nation Economic Development, and the U.S. Economic Development Administration has awarded another \$1 million for construction.
- Anticipated completion date: 3/20



ELECTRICAL ENGINEERING

- Concentrations:
 - Computer Engineering
 - Electrical Power & Energy
- Research Areas
 - Drones/Rovers Design & Test
 - Sensors and Instrumentation
 - Micro Grid Technology
 - Solar Vehicle Design



METROLOGY

- Coordinate Measurement Machines
 - Hexagon Metrology
 - FaroArm w/Laser Attachment
 - Faro Tracker
 - Quest 650 Multisensor
- CT Scanner
 - North Star Imaging 3000
 - Dual Head Sub Micron Resolution
- White Light Scanner
 - HDI
 - ATOS 3M



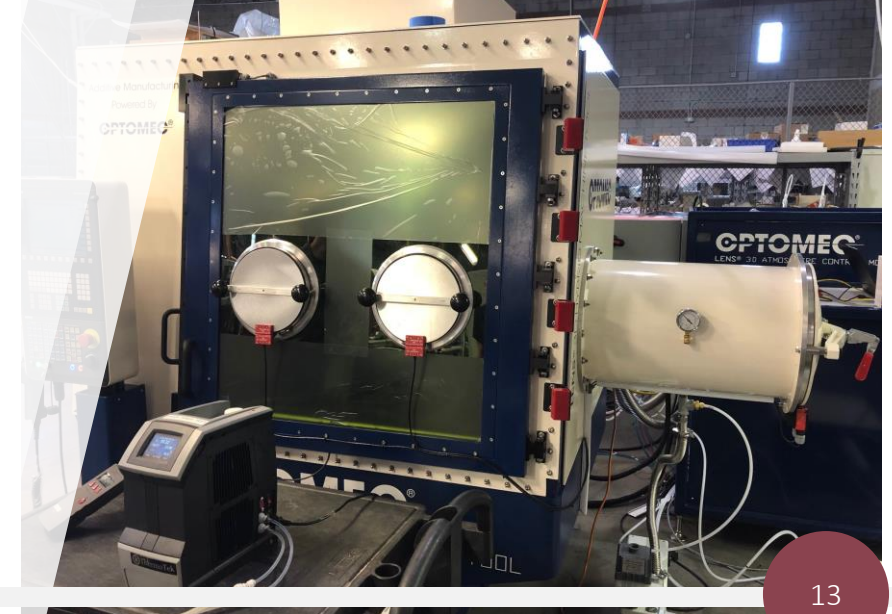
Material Testing & Characterization

- Specimen Preparation
 - Cut-off Saw
 - Mounting Press
 - Multi-specimen Polisher
- Microscopy
 - Keyence VHX6000 3D Microscope
 - JEOL SEM
- Testing Equipment
 - Instron Tensile/Compression
 - Instron Dynamic Tester



Manufacturing Additive Manufacturing

- Polymer AM
 - ProJet 3600
 - Objet 30Prime
 - MarkForged (2)
 - Makerbot (5)
- Optomec MTS 500
 - Direct Energy Deposition (DED)
 - Hybrid (Machining Capabilities)



Manufacturing Subtractive Manufacturing

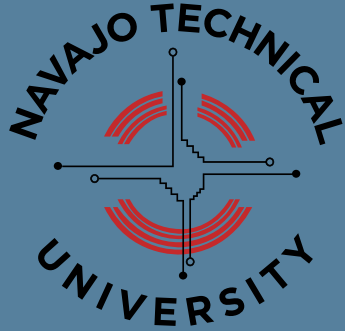
- CNC Mill
- CNC Lathe
- CNC Horizontal Band Saw
- Electric Discharge Machining (EDM)



STUDENT HOUSING (90,000 sq. ft.)

- Three story, 277 bed dorm has been achieved. The Navajo Housing Authority contribution of \$9.3 million has been approved.
- The Navajo Nation has approved \$14.3 million from the *Sihasin* fund.
- Awaiting business site lease with Navajo Nation
- Anticipated completion date: 7/22





QUESTIONS

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